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No. X.

General Observations on the Birds of the Genus TETRAO ; with a Synopsis of the Species hitherto known. By Charles Lucien Bonaparte, Prince of Musignano, &c. Read June 20th, 1828.

THE genus TETRAO, in the extent given to it by Linné, was so comprehensive, that he might with almost equal propriety have included in it all typical gallinaceous birds. It comprised species, differing not merely in their external characters, but even in their peculiar habits claiming only a remote affinity. Latham very judiciously separated from it the genera *Tinamus* and *Perdix*, which latter he restored from Brisson. Illiger also contributed to our more accurate knowledge of these birds, by defining two other natural genera, *Syrnhaptes* and *Ortygis*. Temminck, in his *Histoire des Gallinacés*, carried the number of genera to seven, but afterwards reunited *Coturnix* to *Perdix*. The real *Tetraones* are divided by Vieillot into two genera, the *Lagopodes* forming one by themselves.

In our arrangement of these birds, we distinguish three subgenera.

I. *Lagopus*, which represents the genus in the Arctic polar regions, whose chilly climates they are admirably adapted to withstand, being thickly clad with close set feathers, abundantly intermixed with down, and covering them to the very nails. Their pure white winter plumage is

an additional protection, by confounding them with the snowy covering of the earth, which prevents their being easily descried by rapacious birds or quadrupeds.

II. *Tetrao*, whose geographical range is limited to the more temperate climates, being still protected by feathers as far down as the toes.

III. *Bonasia*, a new division for which we propose *Tetrao Bonasia*, L. as the type. In these, the upper portion only of the tarsus is feathered. They occasionally descend to still more southern countries, frequenting wooded plains, as well as mountainous districts, to which latter the true Grouse give the preference. The entire genus is however, properly, boreal, and is found exclusively in North America, Europe, and Northern Asia. The long and sharp winged Grouse, which replace them in the arid wastes of Africa and Asia, one being met with also in the southern extremity of Europe, we consider, in common with all modern authors, as a totally distinct genus. This small group, composed of a limited number of species, inhabits wild regions, remote from man and cultivation, preferring burning deserts to the shelter of the woods. Wandering near the confines of these oceans of sand, so terrific to the eye and the imagination of the human traveller, they boldly undertake to cross them in numerous bands, in search of the fluid so indispensable to life, there found only in few and distant spots. Over the intervening space they pass at a great elevation, and with extreme rapidity, being the only birds of their order that are furnished with wings of the form required for such flights.

The Grouse, on the contrary, inhabit forests, especially such as are dense, and situated in mountainous districts; the *Bonasiæ* however, as well as the American Pinnated Grouse and Cock of the Plains, frequenting level countries, where grow shrubby trees of various kinds. The Arctic *Lagopodes* are also found on the lofty mountains of Central Europe, where the great elevation affords a temperature corresponding to that of more northern latitudes. There they always keep among

bushes, on the dwarf willows, which, with pines, form the principal vegetation of those summits.

The Grouse feed almost exclusively on leaves, buds, berries, and particularly the tender shoots of pines, birch, and other trees, resorting to grains only when compelled by scarcity of their favourite food during severe winters and deep snows: they will, however, pick up a few worms or insects, and, especially when young, are fond of ants' eggs. Like other gallinaceous birds, they are frequently employed in scratching the earth, are fond of covering themselves with dust, and swallow gravel and small pebbles to assist digestion. No birds are more decidedly and tyrannically polygamous. As soon as the females are fecundated, the males separate from them, to lead a solitary life, without showing any further concern for them or their offspring; though, like perfidious seducers, they are full of attentions, and display the greatest solicitude to secure the possession of those they are soon after so ready to abandon. The nuptial season commences with the first appearance of leaves in the spring. The desire of procreation manifests itself by extraordinary sounds and gestures. Their voice becomes sonorous, the males appear quite intoxicated with passion, and are seen, either on the ground, or on the fallen trunks of trees, with a proud deportment, an inflamed and fiery eye, the feathers of the head erected, the wings dropped stiffly, the tail widely spread, parading and strutting about in all sorts of extravagant attitudes, and uttering sounds so loud as to be heard at a great distance. This season of ardour and abandonment is protracted till June. The deserted female lays, far apart on the bare ground, in some thick and low coppice, from eight to sixteen eggs, breeding but once a year. They hatch and rear their young precisely as the common fowl, the chicks being carefully protected by the mother only, with whom they remain all the autumn and winter, separating in spring on the return of the breeding season. It is at this period only that the males go in search of the females, and show a fondness for their company.

The Grouse are shy and untameable, avoiding the settlements of man, and retiring to wild and barren tracts, where they associate in packs or families. The *Lagopodes* only live in very numerous flocks, composed of several broods, which do not disperse until they separate in pairs at the return of the breeding season. Except in spring, the Grouse keep always on the ground, perching on trees only to pass the night, or when disturbed; by day retiring to the deepest recesses of the forest. The flesh of all is exquisite food, though dark coloured in some and white in others. The black meat is compact, juicy, and highly flavoured; while the white has in its favour, delicacy and lightness.

The Grouse are distinguished by a short stout bill, feathered at base; they are of all gallinaceous birds those in which the upper mandible is the most vaulted; the feathers of the bill are very thick and close, and cover the nostrils entirely. The tongue is short, fleshy, acuminate, and acute; and the eye surmounted by a conspicuous red and warty naked skin. Their legs are without spurs in either sex, and partly or wholly covered with slender hair-like feathers, which in the *Lagopodes* are thicker and longer than in the others, extending not only beyond the toes, but even covering the sole of the foot, a peculiarity which, agreeably to the observation of Buffon, is of all animals again met with only in the hare; and as if nature wished to carry her liberality to them still further, this covering becomes longer and closer in winter. The toes of the other species are rough beneath, and furnished with a row of processes or pectinations each side. The roughness of the sole appears requisite to enable the bird to tread securely on slippery ground and frozen snow; as well as to enable them to grasp the branches of trees covered with ice or sleet. In the *Lagopodes*, the nails are peculiarly adapted for removing the snow from over the vegetables on which they feed, and are for this purpose not only useful but indispensable instruments. All the genus have short rounded wings; the first primary is shorter than the sixth, the second being but little shorter than the third and fourth, which are

longest. The tail is usually composed of eighteen feathers, generally broad and rounded. The Red Grouse, however, *T. scoticus*, as well as the *T. bonasia*, and the *T. canadensis*, have but sixteen, while the two new North American species have twenty: one of the latter, moreover, has these feathers very narrow and pointed, a character which is also found in the sharp tailed Grouse. They have the head small; the neck short, and the body massive and very fleshy.

The females of the larger species differ greatly from the males in colour, the latter being glossy black, or blackish, whilst the former are mottled with gray, blackish, or rufous: such are all the typical *Tetraones* of Europe, and the cock of the plains, the dusky, and the spotted Grouse of America, the latter being of smaller size. The smaller, mottled species, such as *T. phasianellus* and *T. cupido*, exhibit little or no difference in the plumage of the two sexes, which is also the case in the *Bonasiæ* and *Lagopodes*. The young in their first feathers are like the female in all the species, and moult twice before they obtain their full plumage. All have a double moult, and most of the *Lagopodes* vary in a remarkable degree with the seasons.

The genus *Tetrao* comprises thirteen species, of which we consider eight as typical, two we arrange under *Bonasia*, and three under *Lagopus**. The species of *Lagopus*, as might be expected from their high northern habitation, are common to both continents, with the exception of the Red Grouse, which is peculiar to the British Isles; and which, from the circumstance of its not changing its colour with the season, forms the passage to the true *Tetraones*. Of these, five inhabit North America, and three Europe, none being common to both. Of the two *Bonasiæ*, one is peculiar to the Old, and the other to the New continent. Thus we find, that of the entire genus, eight are distributed to America, and seven to

* Even the modern *Tetrao rupestris* we do not consider well established: as for that of former authors, it is undoubtedly *T. lagopus*. We are equally sceptical with regard to *T. islandicus* and *T. montanus* of Brehm.

Europe. Leaving aside the two that are common to both, and the respective *Bonasiæ*, we may draw the following parallel between the remaining species of the two worlds. The cock of the woods, or capercaillie of Europe, (*T. urogallus*) corresponds to the American cock of the plains, (*T. urophasianus*). The black game, (*T. tetrix*) finds its equivalent in the dusky Grouse, (*T. obscurus*). The *T. hybridus* or *medius*, has no analogue in America; neither has *T. scoticus*. They are however more than replaced as to number by *T. phasianellus*, *T. cupido*, and *T. canadensis*, all American species, that have none corresponding to them in the Old world.

Being perhaps the only naturalist who has seen all the known species of Grouse of both continents, having enjoyed the advantage of examining many specimens even of the rarest, and possessing them all but one in my own collection, I am peculiarly well situated for giving a monography of this interesting genus. Such a work it is my intention to publish at some future period, illustrated with plates, and accompanied by further details of their habits. They are all found in Europe and North America, some of the European occurring also in Asia, from whose elevated central and northern regions, as yet unexplored, may be expected new species that still remain to be discovered. The extensive wilds of North America may also furnish others; but we do not think it probable; for since we have become acquainted with both sexes of *T. obscurus*, and *T. urophasianus*, we are not aware of any indicated in the accounts of travellers that cannot be satisfactorily referred to known species.

TETRAO.

I. BONASIA.

Tetrao, Vieill. *Coqs de bruyères*, Cuv. *Bonasa*, Stephens.

Lower portion of the tarsus, and toes, naked. Not varying much with the seasons. Crested and ruffed; tail elongated and rounded; female similar to the male; flesh light coloured.

Dwell in dense forests composed of different kinds of trees.

1. *Tetrao bonasia*, L.

Mottled; tail composed of sixteen mottled feathers, the lateral gray, with a broad black subterminal band.

Male; sides of the neck with a ruff of small feathers; uniform with the rest; throat black.

Female and young; ruff smaller, throat white.

Hazel Grouse, Lath. *La Gelinotte*, Buff., pl. enl. 474, male; 475, female.

Inhabits wooded mountains in the central parts of the old continent: rather common in several districts of eastern Germany.

2. *Tetrao umbellus*, L.

Mottled; tail of eighteen mottled feathers, all ferruginous, and with a black subterminal band.

Male; a ruff of large black feathers on the sides of the neck; throat white.

Female and young; ruff smaller, dark brown.

Ruffed Grouse, Wils. Am. Orn. vi. pl. 49, male.

Inhabits North America; common, especially in mountainous pine districts.

II. TETRAO.

Tetrao, Vieill. *Coqs de bruyères*, Cuv. *Tetrao*, *Bonasa*, Stephens.

Tarsus wholly feathered, toes naked. Not varying much with the seasons. Found in temperate climates, even at a comparatively low latitude, and in level as well as mountainous countries. Flesh dark coloured.

3. *Tetrao urogallus*, L.

Bearded; tail much rounded, of eighteen broad rounded feathers; bill white.

Male; glossy black, breast with greenish reflections.

Female and young; mottled.

Wood Grouse, Lath. Penn. Brit. Zool. pl. M. male; pl. N. female.

Inhabits mountainous forests of Northern Asia and Eastern Europe; less abundantly in central and south-eastern Europe.

4. *Tetrao urophasianus*, Nob.

Tail cuneiform, of twenty narrow, tapering, acute feathers.

Male; black?

Female and young; mottled.

Cock of the Plains, *Tetrao urophasianus*, Nobis, Am. Orn. iii. pl. 21, fig. 2.

Inhabits the extensive plains between the Missouri and the Rocky Mountains. Size of the preceding, and the largest of North American Grouse.

5. *Tetrao hybridus*, Sparrm.

Slightly bearded; tail hardly forked, of eighteen feathers; bill black; tarsus two inches long.

Male; glossy black, breast with purple reflections.

Female ; mottled.

Tetrao hybridus, Sparm. Mus. Carls. 1. pl. 15. ad. male.
Tetrao medius, Meyer, Temm.

Inhabits the high north of the old continent : most common in Russia and Lapland, but nowhere abundant ; rare and accidental in central Europe.

6. *Tetrao tetrix*, L.

No beardlike appendages ; tail deeply forked, of eighteen feathers, the exterior turned outwards ; under tail-coverts white ; tarsus one inch and a half long.

Male ; glossy black, with violaceous reflections.

Female ; mottled.

Black Grouse, Lath. Buff. pl. enl. 172, male ; 173, female.

Inhabits Northern Asia, and Northern as well as Central Europe.

7. *Tetrao obscurus*, Say.

Tail slightly rounded, of twenty broad, rounded, blackish feathers.

Male ; black.

Female and young ; dusky brown, somewhat mottled.

Dusky Grouse, *Tetrao obscurus*, Nob. Am. Orn. iii. pl. 18, female. *T. Richardsonii*, Sabine.

Inhabits near the Rocky Mountains. Size of *T. tetrix*.

8. *Tetrao canadensis*, L.

Tail rounded, of sixteen black, rounded feathers ; breast, flanks, and tail-coverts spotted with white.

Male ; black, waved with gray ; throat and breast deep black.

Female ; mottled ; throat and breast banded with black and rufous.

Spotted Grouse, *Tetrao canadensis*, Nob. Am. Orn. iii. pl. 22, male ; pl. 21, fig. 1, female.

Inhabits the north of America, extending from the Rocky Mountains to the state of Maine.

9. *Tetrao phasianellus*, L.

Mottled; tail short, cuneiform, of eighteen narrow square feathers, the two middle ones much elongated, the outer white at the point.

Male and female; similar.

Winter plumage much darker and more glossy.

Sharp tailed Grouse, *Tetrao phasianellus*, Nob. Am. Orn. iii. pl. 19.

Inhabits Arctic America, as well as the high ranges of the Rocky Mountains.

10. *Tetrao cupido*, L.

Mottled; tail rather short, much rounded, of eighteen plain dusky feathers; primaries spotted with white on their outer webs.

Male; furnished with wing-like appendages on the neck, covering two loose, orange-coloured skinny bags.

Female and young; destitute of the cervical appendages and skinny bags.

Pinnated Grouse, Wils. Am. Orn. iii. pl. 27, fig. 1, male.

Inhabits certain districts both of the eastern and western United States: common on the Missouri, and even on the Oregon.

III. LAGOPUS.

Lagopus, Vieill. Stephens. *Lagopèdes*, Cuv.

Tarsus and toes, and even the sole of the foot entirely covered with feathers. Head without a crest. Tail rounded. Most of the species varying greatly with the season, becoming white in winter. Female differing but little from the male.

Confined to Arctic countries, or the regions of perpetual snow. Dwell in forests chiefly composed of pines: never alight on trees; fond of rocks. Collect in large flocks. Monogamous, pairing in spring.

11. *Tetrao scoticus*, L.

Reddish chesnut; feathers of the feet gray; tail of sixteen feathers, the lateral blackish, tipped with reddish; primaries sooty black; eyebrows papillous, elevated, denticulated.

Female; duller, more mottled.

Winter and summer plumage alike.

Red Grouse, Lath. *Lagopus scoticus*, Vieill. Gal. Ois. pl. 221.

Inhabits the British Islands: common in Scotland.

12. *Tetrao lagopus*, L.

Feathers of the feet snow-white; tail of eighteen feathers, the lateral black; bill moderate, compressed at the point; nails black, subulate, arcuated.

Winter plumage, snow-white; summer, reddish-gray mottled with black.

Male; a black band through the eye, which the female is without.

Ptarmigan, or *Rock Grouse*, Lath. *Le Lagopède*, Buffon, pl. enl. 129, female in winter; pl. 494, female acquiring summer dress.

Inhabit the Arctic regions of both continents, as well as the lofty mountains of the old, whence in winter they descend to moderate elevations: common at Hudson's Bay, in Russia, Switzerland, &c.

13. *Tetrao albus*, L.

Feathers of the feet white; tail of eighteen feathers, the lateral black; bill short, stout, depressed at the point, blunt; nails white, long, hardly curved.

Winter plumage snowy white, no black band through the eye: summer, reddish chesnut, mottled with black; throat unspotted.

Female hardly differing from the male in summer, and perfectly similar in winter.

White, and *Rehusac Grouse*, Lath. *Tetrao saliceti*, Temm. Frisch. pl. 110 & 111. *White Partridge*, Edw. Glean. pl. 72, male moulting.

Inhabits the Arctic regions of both continents, to the very pole; scarcely ever seen even on the highest mountains of Central Europe; common in Lapland, Iceland, Greenland, and Kamschatka: found also at Hudson's Bay, and on the northern side of Lake Superior.